



Broiler Production

Glossary of terminology



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Note to the learner

The Glossary of Poultry terminology set out below serves to provide you the learner with a list of commonly used terms that are applicable to the Poultry industry. Many of the terms set out below are found in other industries as well, however the context we are focussing on is that of the poultry sector in particular Broiler Production.

GLOSSARY OF POULTRY TERMINOLOGY	
WORD OR CONCEPT	
Air leaks	Doors that do not fit or seal properly allow air to enter. In mechanically ventilated buildings air leaks result in the lowering of air speed through the louvers and the air does not mix properly with inside air. This is because such leaks (openings) have increased the total air inlet size, in other words more space is available for the air to enter into the building causing insufficient turbulence of the air. It is also important that all louvers will open to the correct size.
Ammonia	Ammonia is a gas with an irritating and pungent smell. It is somewhat soluble in water. A product known as Scrubs of Ammonia generally used as cleaning agent by many households.
Ammonia control	Ammonia is a gas that causes movement of cilia on the inner lining of the respiratory tract to stop and to degenerate, be sloughed off, baring the inner tissue layers and making it easy for disease causing organisms to penetrate the body and cause disease. <i>Also see skin cracks</i>
Ammonia on the health	The gas causes a degeneration (sloughing off) of cilia in the respiratory tract and suppresses the functions of those organs involve in the production of antibodies to protect the bird against virus infections
Antibacterial compound	Is a substance that has the ability to destroy bacteria, such as lysozyme, when it comes in contact with those organisms. Lysozyme is present in saliva (spit) and in tears of the eye.
Antibodies	Antibodies are proteins that are produced by organs involved in immune development, such as the thymus glands in the neck of the bird or the bursa of Fabricius in the cloaca. The development of antibodies against a certain disease is stimulated in response to a vaccine that was made from organisms (bacteria or viruses) that causes that particular disease, say IB or Newcastle disease. Antibodies will also develop in birds in response to a live virus transmitted by wild birds and they might die if large numbers of the virus penetrated their bodies and antibodies were not produced quick enough to neutralize the viruses.
Bacteria	Bacteria are more hardy organisms than viruses and many different types occur in poultry houses, in the dust, bedding and in the excreta, not all cause disease symptoms. Many bacteria serve useful purposes by degrading waste material and some types are used for the production of medicine.
Bedding	The main requirement for a suitable material is that it must be clean, free from mycotoxins and be able to absorb moisture excreted in the faeces. Wood shavings are the best but have become expensive and scarce. Other materials such as sunflower hulls, chopped mealie cobs and peanut hulls are also used in

areas where such products are available. A normal practice is to buy bedding that has been fumigated with formaldehyde to ensure that no harmful bacteria and fungi are present.

Belly

The soft part underneath the chicken containing the internal organs such as the intestines.

Carbon dioxide

The gas exhaled by the chicken, the chemical formula is CO₂. It is formed in body tissue as a result of the utilization of oxygen when glucose is oxidised ('burned') to render energy for reactions such as muscle contraction, formation of proteins and all the many other metabolic reactions taking place in the tissues of the body. Carbon dioxide is transported to the lungs where it is exchanged for oxygen and exhaled through the respiratory tract. It is used in hatcheries to euthanize (kill) the day-old male chickens of commercial laying-strain poultry as well as other chickens.

Carriers

Disease causing organisms can be transported on peoples' clothes, their shoes, in their hair and on their body. People can thus be regarded as carriers of bacteria and viruses. Viruses can also be present in some organs of animals, especially wild birds or even other poultry. They might not show disease symptoms but the organisms are present in their body's system and they excrete the organism in saliva and in other cases the organism can be excreted in eggs by laying hens.

Cilia

Hair like structures in the respiratory tract that perform sweeping actions to move micro-organisms up the respiratory tract into the mouth cavity to be swallowed by the bird. This prevents infections of the lungs and air sacs. Ammonia causes a degeneration of these structures and makes it easy for organisms to penetrate the blood system and to make the bird sick.

Coccidia

This group of disease causing organisms are able to survive in the soil for years and when carried into the chicken house where it is warm and moist, they become infective (ready to cause disease) and when swallowed they penetrate the intestines causing massive bleeding. The reproductive cells of coccidia are excreted in the faeces and become infective again under favourable conditions of temperature and moisture in the bedding material.

Coccidiosis

A disease caused by coccidia that have penetrated the wall of the intestinal tract.

Collecting body weights

A representative sample of chickens are weighed individually with the purpose of establishing the coefficient of variation (CV) and also to see whether the birds have put on weight according to the standards that have been set by the breeding company.

Cracks to develop in the skin

Cracks in the skin under the feet of broilers are caused by high levels of ammonia in the bedding material. High moisture air in the bedding creates favourable conditions for bacteria to degrade uric acid with the liberation of ammonia.

Crumb and pellet sizes

Crumbs are normally produced by putting pellets through a roller and then to remove the very fine particles by means of a sieve. The crumbs ensure that a day-old chicken would consume a complete diet and thus gets all nutrients for a good start. The small pellets serve the same purpose of crumbs except that less wastage occurs with pellets.

Curtains

The main purpose with curtains is to protect the birds from cold wind. The curtain material has some insulating value which helps to maintain a favourable brooding environment during the early life of the chicken.

CV

CV stands for Coefficient of Variation which is a figure that indicates how widespread the body weights are around the mean value (average value) of the flock. A figure of 8% is regarded as acceptable but values higher than that is an indication that there is too much variation in weights; many chickens are in the lighter ranges and a lot of chickens in the heavy group, those close to the average weight is thus small which means not many chickens are available to the fast-food outlets such as Kentucky, who requires a uniform size that varies between narrow margins, for example between 1750 and 1850 grams and not between say 1600 to 1900 grams.

Dehydration

This means the chicken has lost a lot of moisture from the blood stream and therefore also from the tissues such as muscles and internal organs. Dehydration happens when chickens pant during very hot weather or during transport in the chicken boxes. They lose moisture during panting from the wet surfaces in the mouth cavity and are unable to drink enough water to make up for the moisture loss. Chickens also need a lot of water to excrete urine but when they are deprived of water the white uric acid crystals accumulate in the kidneys and on the liver.

Digestive system

Responsible for breaking up feed particles into absorbable nutrients such as glucose from starch and amino acids from proteins. Fats, minerals and vitamins are absorbed as such. The blood stream is responsible to carry nutrients to the different body tissues to enable them to grow and to fulfil essential functions in the body.

Disease causing organisms

These include the following organisms: viruses, bacteria and protozoa. These organism penetrate the body and attack specific organs and typical symptoms of a disease is caused. Fungi are very small plant-like organisms that produce poisonous substances (mycotoxins) onto the material they grow. These mycotoxins cause lesions (sores) in the mouth cavity and they also interfere with the production of antibodies to protect the bird against a disease.

Dislocation

It means that a bone is displaced from the joint to which it is attached. In some cases it might heal up again but it could also cause a malformed bird that cannot function properly and it becomes a runt.

Down

The hair-like structures with which the chicken hatches. It has very poor insulating value and if the chicken is placed in a cold environment it will lose a lot of heat. The down is replaced with chick feathers within a few days and the chick is then able to better withstand draughts provided the air temperature is not too low.

Draughts

It is air stream moving over the chickens and making them uncomfortable because of the temperature that is either below or above the range in which the chickens are able to maintain their body temperature without shivering or huddling.

Dust

Dust consists of very small particles of feed and material from the bedding. These particles are so small that they float in the air and can thus be removed by ventilation. They will accumulate on fan blades and louvers and can also be inhaled by chickens into the air sacs. Dust carries a very large amount of viruses and bacteria that can lead to a disease situation.

E. coli

The *E. coli* bacteria are the most common type in a chicken house and a chicken in good health will not be affected by these organisms. However, in a chicken that is suffering from a low level of disease these organisms will take advantage of the situation and will first multiply in the air sacs in the abdominal cavity but their numbers increase so rapidly that they spread to the membranes covering organs such as the heart and liver.

Efficiency of feed utilization

This term refers to the quantity of feed utilized to produce one kg of body mass. The terminology that is generally is the FCR value, this is the short for Feed Conversion Ratio. In practice it is calculated by dividing the quantity of feed consumed during the growth period by the weight of the birds delivered to the abattoir.

Egg yolk

The yolk of an egg is normally regarded as that yellow part that is surrounded by the white albumen. It contains the reproductive cell of the hen and after fertilization the embryo grows and utilizes the yolk material (fats and proteins) as well as the white albumen that consists also of proteins, and water. At the end of the hatching period what is left of the yolk material, is still contained in a sac and is drawn into the body cavity as reserve nutrients.

Energy utilization

The bird obtains energy from glucose. It is the same for humans, it is well-known that many energy containing drinks are on the market for long distance runners and other sports persons to serve as source of energy. The energy locked up in glucose is used for various purposes such as muscle contraction to walk, to enable various body systems to perform functions such as producing egg yolk, growing of feathers, growing of muscle, too many to mention. In all these reactions heat is produced as part of the energy that has been unlocked. The same situation exists in the engine of a car. Fuel is ignited to cause movement in the flywheel of the engine but at the same time heat was generated.

Evaporation

Evaporation is the changing of water as a liquid to a vapour into the air. Air movement over the surface of the water is important so that new air comes in to absorb the moisture. It is also important that in the case of drying bedding material one has to expose the wet areas to the air flow so that the water can be taken up by the air. That is why bedding material has to be turned. In a closed container water will not evaporate because the air in the empty space on top of the water is saturated with moisture.

Faeces

Faeces are the indigestible fraction of the feed which contain no more nutrients that can be absorbed and used by the bird. In poultry it is mainly the fibre fraction of the feed that makes up the faeces. An example of a high fibre product is sunflower husks or wood shavings.

Fan blades

Fan blades are the driving forces behind air movement. Depending on the design, a fan can either push the air in a direction or suck the air from an area. The displacement of air results in vacuum and air from a

neighbouring area will then move to fill the vacuum. The larger the blades and the higher the speed of the fan blades the more air will be moved.

Fungi

Fungi are primitive plants, they are also known as mould. They grow in moist conditions on almost any material and is most commonly seen in households on fruit such as peaches, bread, against the ceilings in bathrooms etc. Moist poultry feed is an excellent food source for fungal growth. During the growth process they secrete toxic substances, known as mycotoxins, onto the feed and when these are consumed by the birds they suppress the development of immunity after birds have been vaccinated.

Glucose

Glucose is the main source of energy for humans and animals. Inside tissue cells many reactions are taking place and all these depend on glucose as energy source. Oxygen is necessary for the oxidation reaction and carbon dioxide is the gas that comes free and is exhaled.

Graph

A graph is really the picture of a set of figures that has been collected on say the body mass of birds during the growth period. The line that connects a set of figures and plotted on a time scale gives the trend and shows when growth rate slowed down or when there was an acceleration of growth. By merely looking at a set of figures without plotting them as a graph makes it difficult to identify such dips or increases in growth.

Heart attacks

The modern fast-growing broiler has the genetic inner drive to eat a lot and to put on weight rapidly. This means that a lot of energy is being used for all those reactions in which new tissue is formed. This places the heart under pressure to supply oxygen-rich blood for those reactions and has to pump blood at an increased rate. This leads to injuries of the heart chamber and heart failure is the result. The term often used for these mortalities is *flip-overs*.

Heat removal from chickens

In the fast-growing chicken a lot of heat is constantly being produced as a result of the many reactions that are taking place to form muscle and other tissue, see *heart attacks*. That heat has to be removed on a constant basis to avoid a situation when the body temperature rises so high that death will result. In a cool environment body heat is taken up by surrounding air and the temperature remains on the normal level. However, if this does not happen the bird starts panting and heat is then removed from the body by means of evaporative heat loss. This means that moisture from the wet surfaces in the mouth and respiratory tract evaporates and that cools the blood supplying those areas.

Immobilised

Meaning "cannot move". Typically it would apply to the effect that ammonia has on the cilia of the inner surface of the respiratory tract.

Infect

It means to contaminate, for example passing on the disease causing organism to another chicken

Infectious bronchitis

Bronchitis is inflammation of the inner linings of the tubes that takes air from the windpipe (trachea) to the lungs. Infectious bronchitis is thus the disease caused by viruses that can be passed from sick chickens to healthy chickens and making them sick.

Inner moist surfaces

See *inner lining of the respiratory tract*.

Light to broilers

Light enables the broiler to feed but rest periods during a number of hours of darkness are essential to reduce downgrades and increase skeleton development.

Limbs

Dislocation of limbs, such as legs or wings, easily occurs due to rough handling during placement. It should thus be avoided as such birds become runts and have to be destroyed.

Lysozyme

This is an enzyme, a chemical substance that has the ability to act on bacterial cells and render them harmless. It is formed by the membranes in eyes and thus present in the tears, also by membranes in the mouth cavity and thus present in saliva.

Maize meal

Also known as mealie meal. It is a very good source of starch and diets would normally contain between 50 and 70 maize meal. The protein content is low, 8 - 9 per cent, and not of good quality to support growth on its own. Soy bean meal is the source of proteins for poultry.

Mechanically ventilated buildings

This is the term used for buildings in which electric fans are used to bring fresh air in and to extract stale air.

Minimum ventilation

During early brooding it is essential that some air exchanges shall take place to remove carbon dioxide exhaled by the chickens and to bring oxygen in. Ventilation is normally on a time switch that will come on for a short period of time to ensure that a drop in air temperature will be hardly noticeable.

Moisture secreted by the cells

Some cells in the body have the ability to secrete moisture, such as those in the mouth cavity. That moisture is part of the cell contents and it is constantly replenished with moisture from the blood stream to maintain the correct balance.

Mould

See *fungi*.

Muscle contraction

Muscle fibres consist of bundles of cells that are able to shorten in length by sliding over each other. This will only happen in response to a message from the brain via nerves that are attached to the muscle. This action to contract and to remain in a contracted state, is accompanied with the use of energy and production of heat.

Mycotoxins

Poisonous substances produced by fungi. They interfere with the processes of immune development following vaccination. Mycotoxins also cause poor growth and lesions inside the mouth cavity

Open-sided buildings

These buildings are fitted with curtains and rely mostly on a wind blowing to bring about ventilation. In some cases these houses are also fitted with fans to ventilate on those days without any wind blowing. The curtains are then closed and the house is operated as a mechanically ventilated building.

Overheated

Some raw materials, such as soy beans, have to be heat-treated to inactivate substances that have a depressing effect on digestibility of the protein in the soya. Equipment for treating raw soya must therefore not overcook the beans to prevent damaging the protein quality.

Oxygen

This is a gas essential to maintain life in an animal. All reactions in the cells of the body rely on energy from glucose. The release of this energy depends on a so-called oxidation reaction whereby oxygen is used and carbon dioxide is formed.

Panting

Increased rate of respiration whereby moisture in the respiratory tract, the mouth and nasal cavity is evaporated to enable the bird to lose body heat. The efficiency of panting depends to a very large extent on the moisture content of the inhaled air from the environment. If the environmental air already contains a high humidity, say 60%, then evaporation of moisture from the wet inner surfaces of the chickens will be poor before the air becomes saturated with moisture and no cooling will take place.

Penetrates the cells

Each body cell is surrounded by a membrane but fluid and nutrients in solution are able to enter. Bacteria are generally too large and they attach to cell membranes causing an infection. Viruses on the other hand are so small that they can indeed enter into the cell contents where they interfere with the normal processes and functioning of a cell.

Post-brooding

This period follows the brooding period and is characterized by changing to increased levels of ventilation, lowering in house temperature and actions being implemented to ensure dry bedding. The feed also changes to larger pellet sizes and feeder and water lines are raised to prevent wastage.

Protein

Protein is the common name for a vast number of chemical compounds that are essential for all life processes in living animals. It is well-known that protein containing foodstuffs are essential to enable the young child or chicken to develop into a strong and healthy adult. Such foodstuffs include meat, cheese, eggs and beans. When consumed the proteins in these foodstuffs are digested, broken up, into their simplest building blocks, namely amino acids. The amino acids are absorbed and transported in the blood stream to cells of tissues in the body where they are linked together again to form the various proteins, characteristic of the particular tissue. Proteins differ because of the number of amino acids and the sequence in which amino acids are bound together.

Puss-like material

The yellow fluid or material caused by a bacterial infection.

Ratio of raw materials

A balanced diet consists of a combination of raw materials such as yellow maize, soya bean meal, minerals and vitamins in various ratios to ensure that the chicken's requirements with regard to energy, protein (amino acids), minerals and vitamins are met to ensure optimum growth.

Rations

Some people rather prefer to use the word "diets" for the feeds that are being fed.

Rodent control

Bait stations are normally used to control rodents. The problem on many poultry holdings is that food for

rodents is almost freely available and more success might be achieved by using liquid bait instead of bait in feed blocks. The importance to control rodents cannot be overemphasized as they are carriers of the bacterium *Salmonellae enteritidis*. This organism can infect poultry and if meat is contaminated it may not be sold.

Saliva in the mouth

Saliva is secreted by cells in the mouth cavity. It contains the antibacterial compound "lysozyme" that has the ability to neutralize bacteria

Shivering

At low environmental temperatures when the body loses more heat than what is being generated by the normal reactions taking place inside the animal, it starts to shiver. Shivering is a condition initiated by the brain instructing contractions by muscle tissue. Such a process requires energy utilization and that results in heat production and is thus a mechanism by which the animal tries to increase its body temperature. Shivering in dogs is always easy to be noticed.

Soybeans

Soybeans are well-known as having a high protein content as well as a good balance of amino acids to meet the chicken's requirement. It is the most widely used source of amino acids for poultry diets.

Spreading pattern

The spreading pattern of chickens during brooding is the best indicator of their comfort in the chicken house.

Stockmanship

The ability of a person to evaluate conditions in a poultry house regarding the comfort of the birds and to supply conditions that enables them to grow or produce at an optimum rate.

Target weight

This is the weight that has been set by the breeding company that should be achieved at a specific age.

Tears of the eyes

Tears contain a combination of watery and oily substances that are secreted by a very thin membrane that covers the eyeball as well as a gland in the lower eyelid. These substances serve as lubricants but it also contains the antimicrobial substance, lysozyme, that is able to neutralize bacteria and thus prevents infections by airborne organisms. The important thing to remember is that the capacity of these substances to protect the bird is limited and therefore dust levels should be controlled in the broiler house.

The temperature of the bird

The normal body temperature of the chicken is 42 °C which is attained at approximately 20 days of age. During hot weather at temperatures of 38 °C the bird has difficulty to maintain its temperature at 42 °C. The rate at which it can lose heat by radiation to the environment and by means of panting, is not enough to keep the temperature at 42 °C. In birds close to slaughter age and especially the bigger ones will experience a body temperature of 45 °C and mortalities will occur when body temperatures reach 46 °C.

Tissues

This is a general term for all soft flesh, and fat, on the bird.

Uniformity

Uniformity refers to the spread of body mass around the mean, in other words, how the weights vary. See "CV" in the Glossary for a detailed discussion on this subject.

Uric acid

Uric acid is the end product in the breakdown of surplus protein from the feed as well as proteins arising from cell contents. It is filtered out of the blood and collected by the kidneys and transported to the cloaca for excretion with the faeces.

Vaccination

Vaccination is the process by which a mild form of the virus (or bacterium) is put into the system of a chicken by injection or given in the drinking water or sprayed by aerosol. A vaccine is not a medicine but it is the disease causing organism in a mild form. Inside the body it stimulates certain organs that are able to make antibodies against the organism used as vaccine, say IB viruses. Antibodies then circulate in the blood stream and when IB viruses come onto the farm from outside the antibodies will bind with the virus and make it harmless.

Vapour

The gaseous form of the liquid, for example water vapour from water that had evaporated.

Ventilation

It means the movement of air through a vent (an opening). In mechanically ventilated buildings the fans **push** the air out of the building and creates an area of low pressure which is filled with air further away and ultimately air is drawn in through the louvers from outside to areas of low pressure

Viruses

Very small single cell organism and can only multiply in body cells of a living animal. They are easily destroyed by sunlight but can survive if protected by faeces or in feathers. Flies can carry viruses for example the Newcastle disease virus.

Vitamins

Vitamins are chemicals included in the feed that are necessary to act as facilitators for reactions in the body.

Water-belly

A condition that develops in fast growing chickens, see "**heart attacks**".

Yolk sac

see "**egg yolk**"